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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,901	12/03/2004	Sang-gi Lee	NEK-0001	2373
23413	7590	07/18/2006	EXAMINER	
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			PUTTLITZ, KARL J	
			ART UNIT	PAPER NUMBER
			1621	
DATE MAILED: 07/18/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/516,901

Applicant(s)

LEE ET AL.

Examiner

Karl J. Puttlitz

Art Unit

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

The outstanding rejection under section 112, second paragraph is withdrawn since the lower pressure limit is clear.

The following is a new ground of rejection under section 112, second paragraph, necessitated by applicant's amendment:

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims have been amended to require that the alcohol is a hydrocarbon compound. It is unclear what alcohols are not hydrocarbon-based.

The prior art rejection to claim 5 is withdrawn since this claim has been canceled. The following prior art rejections are maintained and repeated below. Applicant's remarks are also addressed:

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,147,884 to Sheng et al. (Sheng).

The rejected claims are drawn to a method for producing an organic acid, which comprises mixing a compound containing one or two aldehyde groups and an alcohol as solvent to obtain a reaction mixture, wherein the alcohol is a hydrocarbon compound; and

maintaining the reaction mixture in a liquid phase in the presence of pure oxygen or O<sub>2</sub>-enriched air containing 25-90% oxygen at a temperature of 0-70 C, under a pressure condition of an atmospheric pressure to 10 kg/cm<sup>2</sup>, and for 2-10 hours.

The rejected claims also cover those embodiments wherein the solvent is used in an amount of 1-55 wt%, based on 100 wt% of the aldehyde group-containing compound.

Sheng teaches process for oxidizing unsaturated lower aliphatic aldehydes, particularly  $\alpha$ - $\beta$  unsaturated aldehydes, to the corresponding unsaturated acids wherein the oxidation is carried out by passage of an oxygen-containing gas through a liquid

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medium containing the unsaturated aldehyde and fluorine-containing organic compound. See column 2, lines 1-7.

The patent teaches that the oxygen-containing gas employed in carrying out the oxidation is generally oxygen itself or air. If desired, molecular oxygen itself may be diluted with a suitable inert gas such as nitrogen, carbon dioxide or helium. See column 2, lines 42-48.

With regard to the solvent, Sheng teaches that the oxidation of the unsaturated aldehyde is carried out in a liquid medium in the presence of at least one fluorine-containing organic diluent in the liquid state under reaction conditions where the diluent is a solvent for the unsaturated aldehyde reactant as well as the unsaturated carboxylic acid product. Useful fluorine-containing solvent-diluents include fluorohydrocarbons, fluoroethers, fluoroalcohols, fluoroketones, fluoroacids and anhydrides, fluoroesters, fluoroamines, and fluoronitriles. See column 2, lines 49-58.

With regard to the amount of solvent, Sheng teaches that the reaction is conducted in the liquid phase in which the unsaturated aldehyde is dissolved in the fluorine-containing organic solvent so that the concentration of fluorinated organic solvent in the combined fluorinated solvent-aldehyde mixture is between about 1% and 95% by weight, based on the weight of the mixture. Generally the concentration of fluorinated solvent will range from 5% to 95%, and most preferably from 40% to 90% by weight, based on the weight of the fluorinated solvent-aldehyde mixture. See column 4, lines 18-27.

Example 1 teaches a reaction time of about 4 hours.

The forgoing anticipates the rejected claims within the meaning of section 102.

Claim 3 is rejected under 35 U.S.C. 103(a) (given *supra*) as being unpatentable over Sheng.

Claim 3 requires that the aldehyde group-containing compound is selected from the group consisting of formaldehyde, acetaldehyde, propionaldehyde, n-butyraldehyde, i-butyraldehyde, 2-methylbutyraldehyde, n-valeraldehyde, nonylaldehyde, caproaldehyde, heptylaldehyde, and 2-ethylhexylaldehyde.

Sheng fails to explicitly teach those specific aldehyde group-containing compounds recited in claim 3. However, Sheng does teach that oxidation of saturated aldehydes, at the time of the invention, was commonplace, see column 1, lines 10-14. Accordingly, those of ordinary skill would have been motivated to modify the disclosure of Sheng to include saturated aldehydes as the aldehyde group-containing compound since Sheng teaches that it was conventional to oxidize these compounds to provide useful carboxylic acids, such as acetic acid and propionic acid. In this connection, the mention of saturated aldehydes teaches the elements of the claimed aldehydes with sufficient guidance, particularity, and with a reasonable expectation of success, that the invention would be *prima facie* obvious to one of ordinary skill. Therefore, Sheng renders claim 5 obvious since the reference teaches or suggests the aldehydes of this claim with a reasonable expectation of success.

Applicant argues that Sheng does not teach the requirement of an alcohol. However, as pointed out above Sheng teaches fluorine-containing solvent-diluents such as fluoroalcohols (see column 2, lines 49-58). Applicant even admits that Sheng also teaches the use of alcohols as a solvent (see reply, page 7). Therefore, the reference still anticipates claims 1 and 2, since it particularly teaches alcohols as solvents.

Applicant does not argue against the propriety of the above 103 rejection, as it applies to saturated aldehydes in claim 3.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-0645. The examiner can normally be reached on Monday to Friday from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman K. Page, can be reached at telephone number (571) 272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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